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A study of mental imagery through detailed questioning

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BOSTON UNIVERSITY
SCHOOL OF EDUCATION

Thesis

A STUDY OF MENTAL IMAGERY THROUGH DETAILED QUESTIONING

Submitted by
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(A.B., Emmanuel College, 1947)

In partial fulfillment of requirements for the degree of
Master of Education

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of Education

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STATEMENT OF THE PROBLEM

CHAPTER I
STATEMENT OF THE PROBLEM

Mental imagery is a personal, intimate experience peculiar to the individual. We know that each individual brings to his reading all the actual experiences that make up his daily living. How far above and beyond the actual experience does the vicarious reading experience carry a person to a flexible, broadening horizon lies in the pictures formed and expanded in the mind stimulated by the printed symbol. These pictures are the substance of mental imagery. The images are the production of both the author and the reader. The purpose of this study is to discover the amount and type of imagery possessed by children.

The following questions will be answered in so far as the data will permit:

1. What is the total amount of imagery possessed?
2. What is the difference in the amount of imagery for boys and girls?
3. What are the types of imagery possessed?
4. What is the difference in the amount of the types of imagery?
5. What is the difference in the types of

imagery and amount of imagery in an indoor and outdoor setting?

- 6. What is the effect of detailed questioning on the imagery of children?

INTRODUCTION TO THE PROBLEM

CHAPTER II

INTRODUCTION TO THE PROBLEM

Definition of Imagery

The term mental imagery, as used in this study, is applied to reading and means the pictures formed in the mind stimulated by the printed symbol. These printed symbols, it is interesting to note, had their origin in picture writing. The hieroglyphics of the Egyptians were pictures symbolizing the image or thought to be transferred to another. The picture-symbol brought into being in the observer's mind the image of the concrete object, action or emotion so symbolized. Through the ages the symbols took on more abstract form and eventually a combination of the individual symbols into words and the words into phrases enables man in an efficient manner to transfer to paper and then to the minds of others through reading his thoughts and ideas. It is through this means that the ideas of great men can be willed to posterity for reflection and enlightenment. It is through imagery that a picture of great events of the past can be seen and related to the present.

It was Aristotle who gave the first definition of mental imagery. He states that "...mental impressions are not signs or symbols, but copies of external reality

likenesses of things themselves. In the act of sensuous perception objects stamp upon the mind an impress of themselves like that of a signet ring, and the picture so engraven on the memory is compared to a portrait.... From these "phantasms" or representations of the imagination the intellect abstracts its ideas or universal concepts."¹

MacLennan says: "Imagery is a name for concrete mental processes taken in their immediate and varied individualities."²

Bentley gave one of the best descriptive definitions of imagery. "The best instance is the imagery which runs along with the novel we are reading. The thread of the plot is mainly carried in accompanying figures and scenes....When we actually lose ourselves in the novel we build up a fictitious present and perceptually behold the creatures and events which are the joint creation of our author and ourself... Here the imaginal functions have already become perceptual."³

1. S. H. Butcher, Aristotle's Theory of Poetry and Fine Art. 4th ed.; London: The Macmillan Company Limited, 1927, p. 125.

2. S. F. MacLennan, "The Image and The Idea," The Psychological Review, 1902. Vol. 9, No. 70.

3. Madison Bentley, The Field of Psychology. New York: Appleton and Company, 1925, p. 266

Clarke states that "Image in popular parlance and often in psychology, means a centrally aroused representation of a visual impression."¹

Imagery then in this study is used with this meaning: Mental Imagery is the picture formed in the mind stimulated by the printed word. The picture runs along with the selection being read and is a composite creation of the author and the reader.

Imagery in Children

"The very young child has great imaginative powers. Most children have an imaginary friend or pet with whom they talk freely. In reading, the child has a more vivid imagery than the average adult. "It seems to be established beyond reasonable doubt that the young child thinks largely in concrete visual imagery....The child up to ten is predominantly a visualizer."²

Kelley says "The imagery of the growing child is so vivid and intense that he frequently has difficulty in distinguishing between imagination and reality, between fancy and fact."³

1. H. Clarke, "Conscious Attitudes", American Journal of Psychology, Vol. 22, 1911, p. 223.

2. S. Colvin & M.R. Myers, "The Development of Imagination in School Children and The Relation Between Ideational Types and The Retentivity of Material Appealing to various Sense Departments", Psychological Monograph, Vol. 11, 1909, p. 23.

3. W. A. & M.R. Kelley, Introductory Child Psychology. Milwaukee: The Bruce Publishing Co, 1936, p. 58.

Cattell concurs that "...children appear to have rich and detailed imagery."¹ He feels that in our civilization people are forced to subdue imagery to essential facts. The imagery of the child is lost in growing up due to lack of use. This reflects Galton's findings in regard to low imagery in men of science. He attributed this low imagery to disuse of the imageric powers. The understanding of a selection can be as deep without images as with them but the accompaniment of imagery greatly enhances the basic facts and allows for more general application of the facts.

Types of Imagery

Most children are visualizers. They transform what they read to their own present and identify it with the known. "Retention through the centers for vision and audition and movement often lead to imagery."²

Lay lists these types of imagery. "Visual, auditory, tactile, gustatory, olfactory, thermal, motor, those of pain, organic, those of emotion."³

1. Raymond B. Cattell, General Psychology. Massachusetts: Sci-Art Publishers, 1941, p. 419.

2. Madison Bentley, "The Memory Image and It's Qualitative Fidelity", The American Journal of Psychology 1899. Vol. 11, p. 23.

3. Wilfred Lay, "Mental Imagery", Psychological Review Monograph, Supplement II, No. 3, May, 1898, p. 1.

Of these types the images of taste and smell are rare in voluntary imagery. Olfactory and gustatory images are difficult to stimulate perhaps due to the fact that these two types of imagery are not necessary to see and remember effectively.

In this study the types of images tabulated and analysed are:

1. Visual
2. Auditory
3. Gustatory
4. Olfactory
5. Tactile
6. Color
7. Motor
8. Time
9. Kinaesthetic
10. Emotion.

PLAN OF THE EXPERIMENT

CHAPTER III
PLAN OF THE EXPERIMENT

The purpose of this study is to discover the amount and type of imagery possessed by children. The elements making up the total image, the frequency of occurrence of these elements and the characteristics of the image were considered.

Selection of Material

The writer constructed three paragraphs for the experiment. These are an orientation paragraph for use with the group as a whole, an outdoor paragraph and an indoor paragraph. Several considerations were adhered to during the construction of the material.

The paragraphs are entirely narrative. No conversation is included as the author felt the inclusion of conversation would tend to interfere with the image of the person and place.

The paragraphs are simple in thought content and meaning. Each paragraph has a thought content within the experience sphere of the subjects or related to actual experience by simplicity of thought. Wavle's investigation of mental imagery in silent reading showed that "The

presence of imagery -- rather than the capacity for it -- varies according to the subject matter of the material being read... Past experience as a factor in mental imagery seems, to the writer, to be of the utmost significance, for it is then implicit that the image evoked by reading will be relevant, not necessarily to the reading matter itself but to the process of thought aroused. If the background of experience is not of sufficient scope to have included previous perception of details described, the image may not be only irrelevant to the passage read, but it may also be a false and inaccurate image."¹

To be more accurate in determining the relation of the subjects in this experiment to the content of the material it should be said that the content is more truly within the environmental sphere of the children. A child can walk down a road four times a day and yet not "experience" any particular sensations from the doing of it. Girls, more than boys, may be said to generally experience the functionings of a kitchen. Exposure to the situation does not presuppose experiencing the situation.

Another aim in the construction of the paragraphs was to prevent any disturbing element in the content to

1. Ardra S. Wavle, A Study of Mental Imagery in Silent Reading, unpublished Master's Thesis, Boston University, 1939.

interfere with imagery. Phipps states in her thesis "While observing and thinking over the reasons why certain themata were remembered better than others in the Mystery Story, the writer felt that the emotional suggestions brought to the child's mind by the story either created interest in him or blocked him. Such "blocking" frequently occurred immediately after an emotional suggestion caught a child's interest. An emotional suggestion apparently does two things to a child; first, it causes him to remember that particular incident clearly, and secondly, it seems to block his mind from taking in any new suggestions for the time being, until the emotional disturbance has subsided."¹

The content of the paragraphs is not emotional either in theme or in construction. The reaction of the individual to the situation presented may prove emotional. This element was purposely included to allow for individual differences in imagery due to individual reactions to the content matter. In the outdoor paragraph, this element is at the end of the paragraph and could not interfere with further imagery. In the indoor paragraph, the emotional reaction would of necessity be more subtle depending upon the child's interpretation of and reaction to the paragraph.

1. Marian E. Phipps, Analysis of Mental Imagery, unpublished Master's Thesis, Boston University, 1944. pp 34-38.

In Clough's study a fair positive correlation was found between indoor and outdoor selections in respect to mental imagery. The author chose to construct one indoor and one outdoor paragraph not to further substantiate the correlation between the two but to discover the difference in the type of imagery on the respective paragraphs if any existed.

The two paragraphs are comparable in length. The paragraphs were kept short in order to focus the attention of the reader on fewer images in the hope of producing rich imagery.

Careful attention was given to vocabulary and an attempt made to keep all words at least one grade level below the grade level of the readers. The sentence length was varied and difficulty of construction avoided. The images in each paragraph are concrete with the exception of the endings. Here an element of individual interpretation was purposely included to allow for freedom of thought and flow of vivid imagery if any existed in the subject.

Where possible only indicative, descriptive words were used. Words with only one connotation were employed to prevent any one word from becoming a stimulus to a flow of imagery wholly irrelevant to the content of the paragraph.

The construction of the orientation paragraph

was undertaken with these same considerations in mind. This paragraph is shorter than the outdoor-indoor paragraphs. The setting of the orientation paragraph is primarily outdoors but placed so that indoor imagery could be evoked. The central subject here is an animal. The author felt that there might be the possibility of a carry over from the orientation paragraph to the paragraphs used to gather data if a human being was used as the subject. This might have been an interesting possibility to note but for the purposes of this study a new central image seemed more desirable.

The Paragraphs

The paragraphs in the order of their presentation are:

Orientation Paragraph

The dog is sitting on the steps. He is wide awake and watching the road carefully. Suddenly he stands up, stretches, and scratches the door. No one answers. The dog lays down and goes to sleep.

Outdoor Paragraph

The boy walks slowly down the road. It is a warm, spring day. He pulls a new piece of grass out of the ground and sticks it between his teeth. Across the field a pond sparkles in the sunlight. The boy jumps over a fence and starts across the field of high grass and flowers. He stops and smells a flower. But now he begins to run. It is spring and there is something in the grass. With a dash the boy is gone and all is still.

Indoor Paragraph

The girl is busy at her work. Only the crackle of paper as she turns the pages and the tick tock of the clock break the silence of the quiet room. She lays her hand on the head of the small animal near her. Suddenly the clock strikes the hour and the girl looks up surprised. She rests against the chair and turns page after page quickly. Jumping up the girl crosses the room and looks out the window. She picks up a scissors from the table and returns to her work.

Selection of Questions

A set of questions were built for each paragraph. These questions, though long in form and detail, are considered as a skeleton form for the interview. To stimulate the subject to a full account of his imagery it was felt necessary to follow his lead during the questioning. On the outdoor paragraph twenty-one possibly present images were selected and questions preceded by "Did you see" or, where the image was an action, "Did you notice" were formulated on these images. On the indoor paragraph twenty possibly present images were tabulated and questions constructed in the same manner. The orientation paragraph contained seven possible images and questions were built to cover them.

Galton set up four criteria for questions. "There is hardly any more difficult task than that of framing questions which are not likely to be misunderstood, which admit of easy reply, and which cover the ground of inquiry"¹

1. Francis Galton, Inquiries into Human Faculty and Its Development. London: Macmillan Company, 1883, pp57-8

The fourth criterion, and most important of all in this situation, is that the questions tempt the correspondent to answer. The writer attempted to fulfill in the formulation of questions the requirements of these criteria.

Under these leading questions a series of suggested queries are listed. These questions use the wording of the paragraph and are a deliberate attempt to provoke imagery. It was felt that the subjects if they gave any indication of imagery (by a yes answer to the leading question) would be unable to express the image in its entirety without help. Whipple states "There will be a certain percentage of matters that he really did observe clearly and to which he can reply accurately that will be brought out only by questioning. These matters may have merely slipped his mind. Or he may have thought of them but felt that they were unimportant."¹

The attempt in the questioning is to recall the thought of the paragraph to the subject's mind and lead him to further explore and enlarge upon the picture he has had present. One might feel that the questions would provoke imagery that was not originally present. However, Galton holds that "There is an absence of flexibility

1. Guy M. Whipple, "The Obtaining of Information: Psychology of Observation and Report," The Psychology Bulletin, July, 1918. Vol. 15, No. 7.

in the mental imagery of most persons. They find that the first image they have acquired of any scene is apt to hold its place tenaciously in spite of subsequent need of correction."¹

The Questions

Questions on Orientation Paragraph

I. Did anyone see the dog?

II. Who can tell us what their dog looked like?

1. How big is the dog?
2. What color is he?
3. What is the breed of the dog? (kind of)
4. What is the color of his eyes?
5. How long is his tail?
6. Is his hair short or long?
7. Did you feel the hair?
8. Did you smell the dog?
9. Did you touch the dog?

III. Did anyone notice how the dog was sitting?

A. Who can tell us how their dog is sitting?

1. Is he sitting on just one step?
2. Where are his front paws?
3. Is he half laying down?

IV. Did anyone see the steps?

A. Who can tell us what the steps looked like?

1. What material are they made from?
2. What color are they?
3. How many steps are there?
4. Where is the dog on the steps? (top, middle)
5. Are the steps steep?
6. Did you touch the steps?

B. Did anyone see anything near the steps? What?

1. Are the steps on a porch? What kind?
2. Is there a building?
3. Is there a yard?
4. Did you see anything in the yard?
5. Did you hear any noises?
6. Did you smell anything?

V. Did anyone see the road?

V. Did anyone see the road?

- A. Who can tell us what their road looks like?
 - 1. What kind of a road is it? (dirt, paved)
 - 2. In which direction is the road from the dog?
 - 3. Did you hear any noises from the road?
- B. Did anyone see anything on the road?
 - 1. Did you see people?
 - 2. Can you describe them?
 - 3. Did you see any cars?
 - 4. Did you see any colors?
 - 5. Did you hear anything?
 - 6. Did you smell anything?

VI. Did anyone see the door?

- A. Who can tell us what their door looks like?
 - 1. What kind of door is it?
 - 2. What color is the door?
 - 3. Is there a curtain on your window? Color?
 - 4. Is your door open or closed?
- B. Did anyone notice how the dog scratched himself?
 - 1. Did he make any noise?
 - 2. Is your dog bigger standing up?
 - 3. How long does he scratch himself?
 - 4. Does he do anything else to himself?
- C. Did anyone notice what part of the door the dog scratched?
 - 1. Did you see any marks on the door?
 - 2. Did you hear the dog scratch?
 - 3. What kind of noise did you hear?
- D. Did anyone see behind the door?
 - 1. Who did you see?
 - 2. What did you see?
 - 3. Is there more than one person?
 - 4. Who is the person?
 - 5. Did you hear any noise?
 - 6. Did you smell anything?
 - 7. Did you touch the door?

VII. Did anyone notice where the dog lay down?

- A. Who can tell us where their dog is laying?
 - 1. Does he go back to the steps?
 - 2. What part of the porch does he go to?
 - 3. Does he do anything before he lays down?
 - 4. Did you hear any noise?

GENERAL QUESTIONS

1. Does the dog live here?
2. Did you know the dog?
3. Did you know the place?
4. Who or what is the dog waiting for?
5. What time of year is it?
6. What time of day is it?
7. Is your picture clear or blurred?

Questions on Outdoor Paragraph

I. Did you see the boy?

- A. Will you tell me what your boy looked like?
 1. How is he dressed?
 2. Is he dressed in his best clothes?
 3. Is he wearing a jacket?
 4. What kind of a shirt is he wearing?
 5. Is he wearing a hat? What kind?
 6. What kind of hair does he have?
 7. Did you see his face?
 8. What color are his eyes?
 9. Did you touch the boy?

II. Did you see the road?

- A. Will you tell me what your road was like?
 1. What kind of road?
 2. Is the road shady?
 3. Is there anyone else on the road?
 4. Is there anything on the road?
 5. Can you tell me about the other things you see?
 6. Did you hear any sounds?
 7. Did you smell anything?
 8. Did you touch anything?

III. Did you notice how the boy was walking?

- A. Will you describe for me how he walked?
 1. Does he stop?
 2. Is he a slow walker?
 3. Where are his hands?
 4. Does he make any noise?
 5. Where is he going?

IV. Did you notice what kind of a day it is?

- A. Will you tell me what the day is like?

1. Where did you see the sun?
2. Where is the sun in relation to your boy?
3. What time of year is it?
4. What time of day is it?
5. Are there any clouds? What kind?
6. Did you feel anything?
7. Did you smell anything?

V. Did you see the piece of grass?

- A. Will you describe it for me?
1. How long is it?
 2. Where was this grass growing?
 3. Is this the kind of grass that might grow in a yard?
 4. What color is the grass?
 5. Did you smell the grass?
 6. Did you taste the grass?

VI. Did you notice him put the grass between his teeth?

- A. Will you tell me how he does this?
1. How much of the grass does he put in his mouth?
 2. Does your boy eat the grass?
 3. Did you taste the grass?
 4. Did you smell the grass?
 5. Did you feel the grass?
 6. Did you hear any sounds?

- B. Did you notice the boy's teeth?
1. Are they nice teeth?

VII. Did you see the field?

- A. Will you describe the field?
1. How big is the field?
 2. On which side of the road do you see it?
 3. Is there anything in the field? What?
 4. Is there anyone in the field? Who?

VIII. Did you see the pond?

- A. Will you describe the pond?
1. How far away is the pond from the road?
 2. Is there anything near the pond? What?
 3. Did you see anything beyond the pond?
 4. Is the water nice?
 5. Does the land slope down towards the pond?

IX. Did you see the fence?

- A. Will you describe the fence?
 1. What kind of a fence is it?
 2. How high is the fence?
 3. Is this a new fence?
 4. Did you feel the fence?

X. Did you notice how the boy jumped the fence?

- A. Will you tell me how he does it?

XI. Did you notice how the boy went across the field?

- A. Can you tell me how?
 1. Is he walking?
 2. Is he in a hurry?
 3. In which direction does he go?

XII. Did you see the grass and flowers in the field?

- A. Will you describe them?
 1. How high is the grass in the field?
 2. What color is the grass?
 3. Is it thick grass?
 4. What kind of flowers are growing?
 5. Are there many flowers?
 6. What color are the flowers?
 7. Did you smell the flowers?
 8. Did you hear any noises?

XIII. Did you see the flower the boy smelled?

- A. Will you describe it?
 1. What color is it?
 2. What shape is it?
 3. Does he bend over to smell it?
 4. Did you smell the flower?

XIV. Did you notice how he smelled the flower?

- A. Will you tell me how he does it?
 1. Does he pick the flower?
 2. Does it take him long to smell it?
 3. What does he do with the flower?

XV. Did you notice him running?

- A. In which direction does he go?

XVI. Did you notice what was in the grass?

- A. Will you describe it?
1. What color was it?
 2. How big was it?
 3. Did it move?
 4. Does it make a noise?
 5. Did you smell it?
 6. How does your boy feel?

XVII. Did you see where the boy went?

- A. Will you tell me where he went?
1. In which direction does he go?
 2. Does he go back down the road?
 3. Does he go towards the pond?
 4. Can you describe the place he goes to?

GENERAL QUESTIONS

1. Did you know the boy?
2. Did you know the place?
3. Was your picture clear or blurred?
4. Did you see more after we talked or did you see more when you read?

Questions on Indoor Paragraph

I. Did you see the girl?

- A. Will you tell me what your girl looked like?
1. How is your girl dressed?
 2. Is she dressed in her best clothes?
 3. What kind of dress?
 4. What kind of hair? Color? Style?
 5. What color are her eyes?
 6. Did you see her face?
 7. Does she have anything in her hair?
 8. Did you touch the girl? Her dress?

II. Did you notice what the girl was doing?

- A. Will you tell me what she is doing?
1. What is she reading?
 2. What is she looking for?

3. Does she like what she is doing?
4. Did you see any pictures or writing in the book? (newspaper, funnies, scrapbook)
5. Were these pictures colored?

III. Did you see the room?

- A. Will you describe the room?
1. What kind of room?
 2. Is the room in a house?
 3. Did you see any chairs? Number? Kind? Where?
 4. Did you see any tables? Number? Kind? Where?
 5. Where are the windows?
 6. How big is the room?
 7. Did you notice the rug? Color?
 8. Where is the girl in the room?

IV. Did you see the clock?

- A. Will you describe the clock?
1. What kind of clock is it?
 2. Did you hear the clock?

V. Did you see the animal?

- A. Will you describe the animal? Kind?
1. Is it small?
 2. What color is it?
 3. What is the animal doing?
 4. Is this the girl's pet?

VI. Did you notice her touch the animal?

- A. How does she do this?
1. Does she lean down to touch him?
 2. Does the animal move when she touches it?
 3. Does it make any noise?
 4. Does the girl's hand move on the animal?
 5. Did you touch the animal? Feeling?
 6. Did you smell the animal?

VII. Did you hear the clock strike?

- A. Can you describe the sound it makes?
1. Where is the clock in the room?
 2. Did you see the time?
 3. Did you count to find the time?

VIII. Did you notice the girl look up when the clock struck?

- A. Can you tell me about her face?
 - 1. How does she feel about what she is doing?
 - 2. Does the time make her nervous?
 - 3. Did you see more of her face when she looked up?

IX. Did you notice how the girl turned the pages?

- A. Can you describe her actions for me?
 - 1. How is she sitting?
 - 2. Where is she sitting?
 - 3. Does she use both hands? How?
 - 4. Did you hear any noise?
 - 5. Did you touch the pages?

X. Did you notice the girl jump up?

- A. Can you tell me how she does this?
 - 1. Does she push herself up?
 - 2. What happens to her book (etc.)?
 - 3. Did you hear any noise?

XI. Did you notice the girl cross the room?

- A. Can you tell in which direction she goes?
 - 1. Do you see more of the room as the girl crosses it?
 - 2. What else do you see in the room?

XII. Did you see the window?

- A. Will you describe it for me?
 - 1. What size is the window?
 - 2. Are there curtains on the window?
 - 3. What kind of curtains?
 - 4. What color curtains?
 - 5. Does she push the curtains aside to look out?
 - 6. Did you hear any sounds?
 - 7. Did you feel the curtains? Window glass?

XIII. Did you see out the window?

- A. Will you describe what you saw?
 - 1. What kind of day is it?
 - 2. Are there any trees?
 - 3. Is there a yard?
 - 4. Are there flowers? Colors? Smell?

5. Did you see any people?
6. Did you see a street?

XIV. Did you see the table?

- A. Will you describe it for me?
 1. What size is the table?
 2. Is there anything on the table?
 3. Where is the table in the room?

XV. Did you see the scissors?

- A. Will you describe the scissors?
 1. What size were the scissors?
 2. What color?
 3. Did you touch the scissors? Feeling?

XVI. Did you notice what the girl did with the scissors?

- A. Will you describe for me what she did?

GENERAL QUESTIONS

1. Did you know the girl?
2. Did you know the room?
3. Was your picture clear or blurred?
4. Did you see more after we talked or did you see more when you read?

Method of Procedure

The orientation paragraph was duplicated and a copy given to each case. Before the silent reading of this paragraph the examiner explained the purpose of the reading, what imagery means and gave a few examples of the kinds of pictures people might see. The examiner stressed that every picture is correct and that there were no "wrong" answers. The paragraph was then read silently allowing time until all were finished. The

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papers were placed face down by each person when they finished reading. An oral discussion was conducted with the group as a whole on their pictures following the question sheet. The people were asked to indicate a yes answer to the leading questions by a show of hands. At random people were selected to give their picture. Three people per question or picture were called on to relate what they saw. The differences in the individual pictures were noted. The examiner carefully pointed out that each and every picture related was correct as mental pictures belong to the individual person and will not be the same.

After all the pictures were discussed it was explained that each person was to do the same thing alone with the examiner after reading different selections. The value of this orientation was tremendous as it saved individual explanation and prepared each of the subjects to read the paragraphs for the purpose of imagery.

The technique used for collecting data was the informal, oral interview. Each subject read the paragraph silently, gave any unaided images and then gave replies to the basic questions. The examiner followed the lead of the subject in each case where images not covered on the question sheet were related. All leading questions on the possibly present images

were asked. If the answer to the leading question was affirmative, detailed questioning was undertaken. If the answer to the leading question was negative, no further questions on that picture were given.

The subjects of the experiment consisted of thirty-two children in grade five. The children were selected at random irrespective of reading ability or chronological age. Eighteen boys and fourteen girls were interviewed.

The interviewing was done in two sittings per case, one for the outdoor and one for the indoor paragraph. The average time for each sitting was one hour.

The responses were recorded in detail by the examiner using a question-answer form. The actual responses were taken in shorthand and later transcribed for analysis. It was felt that this method only would give a true picture of the total image as related by each child.

Method of Scoring

The method of scoring the responses to the questions was decided upon after all the responses of all the cases had been appraised. No credit was given for mere repetition of the material in the paragraphs even if this repetition was preceded by "I saw", "I smell", "I taste", etc. To qualify for scoring a response had to include some description or elaboration on the image presented in the content or added by the reader. The number

of possibly present images (e.g. the content matter of the paragraphs arbitrarily marked of into individual pictures) was decided. These possible images number twenty-one for the outdoor paragraph and twenty for the indoor paragraph. The questions were built around these images and the scoring also centers around these images allowing, however, for all added pictures not contained in the content of the paragraph. It is in this area, the filling out of the pictures presented by the author, that the distinguishing features of rich imagery lies.

To tabulate the number and type of each image reported a score of one was given for each elaboration on the image. Since within the framework of a central image different types of imagery appear, a score of one was given for each type of imagery in its respective category. To serve as an example of the manner of scoring an acceptable response and score is included here.

RESPONSE: (road, paragraph 1)

There's tall grass on either side of the road. Dirt road. There is a car, an old car with a man in it. A young man and a brown dog in the back of the car.

SCORE:

Visual Imagery
 1 for grass
 1 for dirt road
 1 for car
 1 for man
 1 for dog

 6 points for visual imagery

Color Imagery
 1 for black car
 1 for brown dog

 2 for color imagery

It is interesting to note here that the car, man and dog are all consistent with the setting of the paragraph but extraneous to the content. No mention of these three items appear in the paragraph. It is here that the necessity of giving a score to each elaboration became apparent. By giving a score of one for each item recorded a spread of scores indicated those who displayed rich imagery in respective categories by filling out their pictures with the inclusion of people, objects and scenery not contained in the content matter of the paragraph. Also, this method of scoring gives an opportunity to those children who, in relating a visual image on a central picture, note ten or more details in that image as opposed to those children who might only report two or three details to receive recognition of their higher degree or amount of imagery. In effect each main image was broken down into its component parts and a score of one given for each part or individual response relating to the whole image.

The criteria used to determine the type of imagery and whether the specific type was actually present in the subject is as follows:

1. Visual Imagery - all images the children said they saw when some description of the contents of the image was

given.

2. Auditory Imagery - all images the children said they heard when a description of the sound heard was given.

3. Gustatory Imagery - all images the children said they tasted when a description of the taste was given.

4. Olfactory Imagery - all images the children said they smelled when a description of the smell was given.

5. Tactile Imagery - all images the children said they touched or felt when a description of the feeling of the thing touched was given.

6. Color Imagery - all images that were colored by the use of color words or words such as light, dark, etc.

7. Motor Imagery - all imagery that showed in the relating a consciousness of motion or action.

8. Time Imagery - all images specifying time whether it be definite clock time, estimate of time of morning or afternoon, time of year (summer, fall, winter, spring).

9. Kinaesthetic Imagery - all images where the children said they felt as if they were doing the action and gave a description of the muscular sensation of such doing.

10. Emotion - this was analysed in relation to the reader expressing a perception of the emotions of the character in the paragraph.

To further acquaint the reader with acceptable responses in each of the imageric types a sample response for each type is included here. All these responses are

are taken from those given on the outdoor paragraph.

Visual

fence - it's a pipe fence, made of iron, old fence.

(Score 3)

Auditory

boy walking - swishing noise as boy walks through grass. I hear it. You know like when you walk through grass that is up to here (shoulders). It makes a noise - it swishes - like a skirt.

(Score 1)

Gustatory

grass - it's juicy - not real wet but juicy from the inside. I can taste it.

(Score 1)

Olfactory

flower - smells like perfume - sweet and clean.

(Score 1)

Tactile

fence - it's smooth. I can touch it and it's smooth. Run your hand on it and it doesn't prick - very smooth.

(Score 1)

Color

road - I see a house on the side - a white house with a purple door - shingled roof - a porch - white fence - red flowers, tulips and roses.

(Score 4)

(Score 6 for visual)

Motor

flower - picks flower to smell it.....throws it on ground and steps on it.

(Score 3)

Time

day - Sun is in east - early in morning.

(Score 1)

Kinaesthetic

field - I look down on the field. I have to bend over to see it.

(Score 1)

Emotion

something in grass -he is afraid of it and runs towards pond.

(Score 1)

(Score 1 for visual)

(Score 1 for motor)

ANALYSIS OF DATA

CHAPTER IV
ANALYSIS OF THE DATA

The purpose of this investigation was to study mental imagery in children through detailed questioning. The data was analysed to discover the amount of imagery possessed by children, the difference in the amount of imagery possessed by boys and girls, the types of imagery possessed, the difference in the amount of the types of imagery, the differences in the amount and types of imagery in an outdoor and indoor setting and the effect of questioning on imagery.

In appraising the data many methods of scoring and tabulating were tried before the method of scoring described above was decided upon. It was obvious from the beginning that any standard measure of attainment preconceived by the author would not suit the purposes of this study. Imagery is a personal process which, as yet, is unbounded by rules for specific content and response. In all studies the assumption that the subject is telling the truth must be made. In this study it is the author's opinion that every child cooperated fully and at all times tried to the best of his ability to relate truthfully the imagery accompanying the reading. Proceeding on this assumption all methods of scoring used experimentally

failed to distinguish between the child with high imagery and one with imagery in a lesser degree. To give the children high in imagery the benefit of the scoring the system described was used. All the computation on the tables, except where noted, is based on the tabulation of the data according to the aforementioned system.

TABLE I
Analysis of Amount of Imagery Reported

	Total No. of Cases	Number Reporting Imagery	Total No. of Images Reported	Mean
Boys	18	18	1418	78.8
Girls	14	14	1243	88.8

The total number of images reported by the 32 cases is 2661.

The number of pictures presented in the content of the paragraphs to provoke imagery is 41. This figure assumes one description or elaboration only on each picture presented. It is impossible to predict the direction of a flow of imagery in individuals. For this reason the figure 41 is considered only as a basis for a comparison with the number of total images reported. If each individual case reported one image or elaboration on each of the 41 pictures presented in content, the total amount of imagery would be 1, 312 images. Every case did not report imagery on each possible image but built up a high total score by filling out their pictures with additions to the image as presented by the author. The mean number of images for the 32 cases is approximately one half more than the number of pictures presented.

The boy subjects and girl subjects interviewed displayed a comparable amount of imagery with a difference of only ten points between the mean scores for boys and girls. There were four more boy cases than girl cases interviewed. The boys, therefore, have a slightly larger number of total images reported. The girls, however, have a higher mean score. The highest individual scores were recorded for girls. The greatest number of images was reported by a girl (Case # 22). For individual total scores see the Appendix, Tables VII and VIII.

The amount of imagery of this particular group of children is good. The awareness of mental imagery was new to them. Some of the children, particularly those rich in imagery, confided that they felt they should not have pictures when they read. The rich imagery that lay dormant in the minds of these children was exposed by the questioning. Both boys and girls displayed a capacity for imagery in varying degrees. There was no great difference in the amount of imagery reported by either sex.

TABLE II

Percent of Subjects Reporting Presence of Each Type of Imagery

32 Cases

Types of Imagery	OUTDOOR		INDOOR	
	No. Reporting Imagery	Percent	No. Reporting Imagery	Percent
Visual	32	100	32	100
Auditory	16	50	19	59.4
Gustatory	5	15.6	0	0
Olfactory	3	9.4	1	3.1
Tactile	7	21.9	12	37.5
Color	32	100	32	100
Motor	31	96.9	30	93.8
Time	24	75	18	56.3
Kinaesthetic	3	9.4	4	12.5
Emotion	17	53.1	6	18.8

In the construction of this table the number of times any one type of image appeared was not considered. If any one type appeared once in an individual subject, that subject was counted as having had that type of imagery.

Visual imagery was found present in 100% of the cases interviewed. Color imagery was also present in all subjects. The color imagery in every case was definite and associated with a concrete object. The words light and dark

were counted as color. In reference to questions on the day and the weather the only color reference in any subject on either paragraph was a blue sky and white clouds. These two responses were not counted as color imagery as they were considered too common and indicated merely a description of the time of year. They were counted as an elaboration on time imagery as a perception of the weather peculiar to spring and summer. Wavle considered color as an attribute of the sense images. In this study color imagery is defined separately to show the percentage of subjects possessing it. It has been stated above and is recognized by the author that color is, in every case where present, an integral part of the visual image primarily and of other sense images in lesser degree. None of the children felt their pictures were colored as a whole but picked up color in description of animate and inanimate things. In the final analysis of the color image it must be granted that in every subject the color imagery did appear as an attribute or characteristic of the visual image particularly and in some cases of the other sense images.

The motor image ranks third in the percentage of cases in which it appears on both paragraphs. Here again, the motor image taken to mean a consciousness of action or movement in the picture is found primarily in the visual image and is an attribute of such imagery. In analysing the data for the motor image a description of the action was

required. To describe an action one must first see it performed. To see it performed one must be conscious of the movement. Motor imagery was defined separately to show the percentage of subjects including it in their imagery.

Time imagery ranks third on the outdoor paragraph and fourth on the indoor paragraph. Time imagery is found in over half the cases in each paragraph. Since time imagery was counted as present when the subject indicated definite clock time, generalizations of morning, afternoon or time of year, the opportunity for such imagery was presented more on the outdoor paragraph. The author feels the presence of a clock in the content of the indoor paragraph limited the time imagery on this selection although generalizations of morning and afternoon were made. In every case the children associated the action of the paragraph with the present day and not with the past. All time images were consistent with the time setting of the outdoor paragraph. On the indoor paragraph any time response was consistent as no indication of time of day or year were given in the content.

Auditory images were present in approximately the same degree in both paragraphs. The auditory images were all consistent with the setting of the paragraphs. On the indoor paragraph this imagery was found in responses to questions on the clock and animal. A response of "tick tock" for the sound of the clock was not acceptable as these words are

a repetition of the paragraph. Responses indicating the sound of the striking of the clock were acceptable. Any sounds reported that were not presented in the content of the paragraph were counted. On the outdoor paragraph the most frequently reported sounds were the rustling of grass, singing of birds and the voice of the boy.

In the sense areas as has been shown visual imagery far exceeds all other types. Auditory imagery ranks second and in their respective order come Tactile, Gustatory, Olfactory and Kinaesthetic imagery. In some minds Tactile and Kinaesthetic imagery may overlap but here the distinction is made that Tactile includes imagery where the children say they touch something in the picture and describe the sensation or feeling of the thing touched. Kinaesthetic imagery includes statements by the children that they are doing the action and describe the muscular movement of such doing. These types of imagery were separate from any other types and did not in any subject fuse with another type. Color appeared in a few cases as an attribute of these sense images. All of the minor sense images were brought out only by detailed questioning, none were reported spontaneously. As a rule those children rich in visual imagery also possessed the faculty for these types of images in a greater degree than the children scoring low in visual imagery. On Tables VII and VIII in the Appendix the totals for each type of imagery found in each subject are given.

Images of emotion were regarded as the perception of the emotions of the characters in the paragraphs by the reader. On the outdoor paragraph two emotional images of the boy were given, one at the beginning and one at the end. The two opportunities for perceiving emotion were provided for in the paragraph and would account for the greater number of emotion images on this paragraph. At the beginning the emotion reported was generally happiness, at the end emotions of fear, excitement and desire. On the indoor paragraph the opportunity for perceiving emotion was not as great and was concerned in all cases with the girl's attitude towards her situation.

Visual imagery is found in 100% of the cases and is generally accompanied by color and motor images. These three followed by images of time and audition make up the greatest part of total mental imagery in the 32 cases studied. The other imageric types are infrequent in occurrence. It is recognized that images of color and motor are attributes of the total visual image.

TABLE III
Analysis of Types of Imagery Reported

Types of Images	Boys 18		Girls 14		All Cases 32	
	Total	Mean	Total	Mean	Total	Mean
Visual	1039	57.7	838	59.9	1877	58.7
Auditory	29	1.6	32	2.3	61	1.9
Gustatory	3	.2	2	.1	5	.2
Olfactory	0	0	4	.3	4	.1
Tactile	10	.6	11	.6	21	.7
Color	169	9.4	213	15.2	382	11.9
Motor	127	7.1	103	7.4	230	7.2
Time	24	1.3	22	1.6	46	1.4
Kinaesthetic	7	.4	4	.3	11	.3
Emotion	10	.6	14	1	24	.8

The total number of visual images reported far outstrips any other type of imagery found present. More than half the images in each case are visual. No other type of imagery approaches the faculty of visualization. In children the sense of sight is the most highly developed faculty. This faculty fulfills their needs for remembering and they are sensitized to its use. From the number of visual images found present it is obvious that observation of the surroundings of the central object of attention also demands visualization. In every case the possibly

present image as presented in the paragraph was elaborated upon and the picture filled out by the addition of people, animals, scenery and other objects. The visual imagery on the added images was as vivid as on the image evoked by the content of the paragraphs. In no case was any inconsistency with the thought or setting of the paragraphs reported in the added image. All added images fit into the framework of the paragraphs. The relevance of the added images to the paragraph is not known. It would seem the relevance would depend upon the need of the individual to have a complete mental picture of the setting, character or action in order to remember them for future use.

Of all the possible images in the selections those that provoked the greatest number of visual images were the boy, the girl, the road, the fence, the field, the animal, the room and the clock. All of these are concrete objects. The physical descriptions of the two characters were rich in visual imagery. The children with high scores gave detailed descriptions of the room and the road in many cases adding people to their pictures as well as scenery and appointments. Visual imagery is present in the greatest measure when the stimulus is a picture word or phrase easily framed in the mind. The imagery on the picture or stimulus word is generally accompanied by images added by the reader .

Images of color and action appear in conjunction

with the visual image. The frequency of these images in relation to the visual image is slight. Images of color in all cases interviewed were present in the visual image of a concrete object and were used to describe that object. The colors were varied and ranged from pastels to brilliant hues. Both boys and girls questioned dressed the boy of paragraph one in bright colors and the girl in paragraph two in light shades and pastels. There was a variety of color in the responses of each child. In no case did the various colors conflict but rather were complementary to one another and were those usually combined in dress and room decorations.

The motor images were brought out under questioning and occurred when the stimulus was present in the paragraph e.g. he pulls, the boy jumps, jumping up, picks up scissors. The motor image usually consisted of one elaboration describing the action and in some cases a demonstration by the child of the action as he saw it.

All other types of imagery are insignificant in appearance, Where reported they were overshadowed by the complete visual imagery of the subject and their presence was brought out only by detailed questioning.

TABLE IV

Analysis of Outdoor Imagery Versus Indoor Imagery

Types of Images	OUTDOOR		INDOOR	
	Number	Percent	Number	Percent
Visual	1109	72	768	68.9
Auditory	31	2	30	2.7
Gustatory	5	.3	0	0
Olfactory	3	.2	1	.09
Tactile	8	.5	13	1.2
Color	206	13	176	15.6
Motor	137	8.8	93	8.3
Time	26	1.7	20	1.8
Kinaesthetic	3	.2	8	.7
Emotion	18	1.2	6	.5
Total	1546	58.1	1115	41.5

In a comparison of the types of imagery and the frequency of occurrence of each type on each paragraph it is evident that on the thirty-two cases interviewed no great disparity in the presence of the various types existed. If a type was low in number on the outdoor setting it was also low on the indoor paragraph. The percentage of times an image type occurs in one paragraph is comparable to its

appearance on the other paragraph.

Visual imagery was the most frequent type reported on either paragraph with 72% of the total number of images on the outdoor paragraph and 68.9% of the total number of images on the indoor paragraph being visual in nature.

Gustatory imagery was nonexistent on the indoor paragraph. The construction of this paragraph was weak in provoking this type of imagery and allowed no opportunity for those cases who displayed the presence of this type of imagery on the outdoor paragraph to do so on the indoor paragraph.

Both paragraphs evoked a comparable amount of imagery. There is no preponderance of one type of imagery in either paragraph. In this particular group of children the difference in an outdoor and indoor setting did not affect the imagery. The outdoor paragraph provoked a slightly higher percent of imagery in the total imagery reported and in the different types of imagery with the exception of tactile and kinaesthetic imagery. This last is due perhaps to the fact that in the indoor paragraph the wording says the girl picks up the scissors. This would allow for the two types to be reported more readily by a subject who possessed these types of imagery.

The Effect of Questioning on Imagery

The questions asked on each selection proved efficient in bringing out imagery that was not reported spontaneously. Each child was given the opportunity to relate his imagery before questioning began. The imagery reported spontaneously was not included in the scoring but a tabulation of the number of cases that gave unaided imagery on each possible image was made. A comparison of the number of cases that reported unaided imagery was made with the number of cases that related imagery under questioning on each of the possible images. Tables V and VI show the comparison of the percent of cases reporting spontaneous imagery on each possible image and the percent of cases reporting imagery under questioning on the same image.

The spontaneous imagery was that imagery reported by the child in answer to the questions:

1. Did you see any pictures as you read?

If the answer was "yes", the question was put

2. Will you tell me about your pictures?

In the construction of these tables a score of one was given for an image on each possible image in the paragraph even though the total image on that possible image might include more than one type of imagery or more than one image of the same type.

TABLE V

Comparison of the Percent of Cases Reporting Spontaneous and Questioned Imagery on Each Possible Image Contained in the Outdoor Paragraph

Possible Image	Spontaneous		Questioning	
	No.	Percent	No.	Percent
1. The boy	16	50	32	100
2. walks slowly	12	37.5	26	81.3
3. down the road.	11	81.3	30	93.8
4. It is a warm, spring day.	5	15.6	31	96.9
5. He pulls	3	9.4	30	93.8
6. a new piece of grass	7	21.9	23	71.9
7. out of the ground and	3	9.4	26	81.3
8. sticks it between his teeth.	3	9.4	25	78.1
9. Across the field	6	18.8	32	100
10. a pond sparkles in the sun.	7	21.9	25	78.1
11. The boy jumps	5	15.6	20	62.5
12. over a fence and	8	25	30	93.8
13. starts across the field	4	12.5	15	46.9
14. of high grass and flowers.	6	18.8	20	62.5
15. He stops and	7	21.9	19	59.4
16. smells a flower.	7	21.9	19	59.4
17. Now he begins to run.	4	12.5	20	62.5
18.....there is something in the grass	2	6.3	15	46.9
19. With a dash	2	6.3	10	31.3
20. the boy is gone	2	6.3	20	62.5
21. and all is still.	0	0	0	0

Total Number of Cases - 32

TABLE VI

Comparison of the Percent of Cases Reporting Spontaneous and Questioned Imagery on Each Possible Image Contained in the Indoor Paragraph

Possible Image	Spontaneous		Questioning	
	No.	Percent	No.	Percent
1. The girl	7	21.9	31	96.9
2. is busy	6	18.8	15	46.9
3. at her work.	16	50	17	53.1
4. Only the crackle of paper as she turns the pages	0	0	11	3.1
5. and the tick tock of the clock	14	43.8	20	62.5
6. break the silence of	0	0	0	0
7. the quiet room.	5	15.6	30	93.8
8. She lays her hand	2	6.3	6	18.8
9. one the head of the small animal	18	56.3	27	84.4
10. near her.	0	0	7	21.9
11. The clock strikes the hour.	6	18.8	16	50
12. The girl looks up.	1	3.1	7	21.9
13. She rests against the chair	5	15.6	10	31.3
14. and turns page after page quickly.	0	0	3	9.4
15. Jumping up	1	3.1	8	25
16. the girl crosses the room..	4	12.5	11	34.4
17. looks out the window.	8	25	20	62.5
18. She picks up a scissors	5	15.6	22	68.8
19. from the table	2	6.3	27	84.4
20. and returns to work.	3	9.4	12	37.5

Total Number of Cases - 32

The questioning brought out imagery on each image from a greater percentage of cases than displayed imagery spontaneously. The questioning enabled those people with little verbal facility to receive aid in expressing their imagery. Wavle showed in her study that the picture first formed in the mind of the reader changes little under interrogation. Imagery is constant and Francis Galton

holds that there is an absence of flexibility in imagery. The questions succeeded in focusing the subject's attention on the minor points of the image and bringing out the finer details of the whole image. Pictures the child might have felt unimportant or not connected to the content of the paragraph were produced after questioning. The reaction of the children to the questioning was more favorable than to the request to tell what you see. From the comparison of the percent of cases relating imagery on the different possible images after questioning to those relating imagery on the possible images spontaneously, it would seem that detailed questioning is an efficient method of probing the depths of the mental imagery of children.

The answers to the general questions at the end of the question form produced the following information from the children.

1. Eleven children recognized the place on the outdoor paragraph and named the location of the place. Six children did the same on the indoor paragraph.

2. Two children recognized the person and identified him by name on the outdoor paragraph. Two children did the same on the indoor paragraph.

3. All the children felt their picture on the outdoor paragraph was clear. Sixteen children felt their picture on the indoor paragraph was clear. six children felt their picture was blurred and one reported a mixture of the two.

The answers to the question concerning imagery before and after reading proved confusing to the children and their responses were not consistent with the imagery already given. For this reason no results of this question are included.

Individual scores for each case for the total amount of imagery and the amount of imagery of each type together with sample responses are included in the Appendix.

SUMMARY AND CONCLUSIONS

CHAPTER V
SUMMARY AND CONCLUSION

The general problem undertaken in this work was the study of mental imagery through detailed questioning with the objective of discovering the amount and types of imagery possessed by children.

Two paragraphs constructed by the author were read by thirty-two children in grade five. The paragraphs had respectively an outdoor and indoor setting. Before the individual reading of these two paragraphs an orientation paragraph, similar in construction, was read silently by the group as a whole and detailed questioning on any imagery present conducted with the group orally. The reading of the two paragraphs was done individually in two sittings, one for the indoor and one for the outdoor selection. The reading was silent. The data on imagery was collected by means of an oral interview between the examiner and child. Detailed questions on each possibly present image were prepared and used as the basis for the interview. All imagery reported by a child was recorded. All imagery reported but not covered by the questions was followed up by the examiner with questions similar in construction to those on the question sheet.

The data was collected and the tabulating and

scoring done as objectively as possible. The findings of this study as to the types of imagery possessed and the frequency of occurrence of those types correlate with the findings of others concerned with the subject. It is felt that this fact justifies the method of procedure and method of analysing the data used in this study.

The following answers to the questions posed in Chapter I were given by the data.

1. A mount of Imagery

The amount of imagery possessed by this particular group of children is good. The mean number of images for the 32 cases is approximately one half more than the number of concrete pictures presented in the content of the paragraphs. The amount of imagery on each individual possible picture presented in the content is not consistently good. The total amount of imagery consisted of images on only part of the possible pictures in the story. When the stimulus was a concrete picture word the flow of imagery was high. Mental pictures of people, things, scenery not included in the content of the paragraphs was frequent. These extraneous images were as vivid and complete as the images on the content images and were consistent with the setting of the paragraphs. They were mostly a filling out of the basic picture as presented by the author in the selections.

2. Difference in Amount of Imagery for Boys and Girls

There were eighteen boy subjects and fourteen girl

subjects interviewed. The boys and girls displayed a comparable amount of imagery. The mean score for the boys is 78.8 and for the girls, 88.8. The highest score on either paragraph was recorded for a girl. Both boys and girls displayed a capacity for imagery in varying degrees for individual cases. The boys did as well and, in a few cases, better than the girls on the indoor paragraph. In this particular group both boys and girls displayed a presence of and aptitude to mental imagery in a comparable degree.

3. The Types of Imagery Possessed

The types of imagery recorded as being present in at least one subject were visual, auditory, gustatory, olfactory, tactile, color, motor, time, kinaesthetic and emotion.

4. The Difference in the Amount of the Types of Imagery

Visual imagery was present in 100% of the cases interviewed. On the outdoor paragraph 72% of the total number of images were visual. On the indoor paragraph 68.9% of the total number of images were visual. Visual imagery exceeded every other type in number of times present.

Color imagery was present in 100% of the cases. The color imagery was in every case connected with a definite object in the image. No child reported overall color in his image. Color imagery appeared as part of the sense images particularly the visual. Color imagery is an attribute of

of the visual image primarily and the other sense images in a lesser degree. The images as reported by the children were not colored pictures but pictures in which the figures and surroundings were colored.

Motor imagery appeared in over 95% of the cases and was, in every case, an attribute of the visual image. Motor imagery and color imagery appeared in almost every child's imagery and were fused with the visual image becoming an integral part of the total visual image. In relation to the frequency of occurrence of the total visual image the color and motor images small in number of times reported.

The sense images of hearing, taste, smell and touch are rare in appearance. Each type was reported by a percentage of subjects with auditory reported by 50% of the subjects interviewed. The appearance of these images in an individual case more than once was rare. The mean number of images of hearing on the outdoor paragraph is 1.6 and on the indoor paragraph 1.9. The sense images listed here were brought out only by detailed questioning and demanded a stimulus that would bring the image into direct focus in the reader's mind. No child reported spontaneous imagery on these particular images whereas the spontaneous imagery of all the children was predominantly visual. These sense images were entire unto themselves and did not fuse with any other type of imagery.

Time images were reported by half the cases but the time image occurred infrequently in the number of times related in each case. This would be a characteristic of this type imagery in an individual case as once the time is set the opportunity for further elaboration on it is negligible.

Images of emotion appeared in 53.1% of the cases on the outdoor paragraph and 18.8% of the cases on the indoor paragraph. Images of emotion were infrequent in occurrence in individual cases. The outdoor paragraph provided better opportunity for this type of imagery.

Kinaesthetic imagery was rare. From the answers to questions referring to this type of imagery it is evident that the children are unaware of its existence and do not experience it as a general rule.

5. Difference in Types of Imagery on Indoor and Outdoor Settings

The imagery on the indoor and outdoor paragraphs is comparable in amount and type. Visual imagery occurs most frequently accompanied by color and motor imagery. There are no significant differences in the imagery on either paragraph in this particular group of children.

6. Effect of Questioning on Imagery

The questioning had a decided effect on bringing out imagery present but not reported spontaneously. The children gained confidence in reporting imagery under questioning and reported many more details of their images

under the direction of the questioning. The imagery reported spontaneously and the imagery reported under questioning was consistent and the images did not change except that many details of each image and other types of images were added.

Implications of the Data

Children do possess mental imagery and their imagery is visual in nature. The visual image has as its component parts color and motor imagery. The other sense images and other types of images are rare in children as in adults. Children are predominantly visualizers and depend upon this sense for much of their remembering. This visual sense comes into full play in mental imagery. The mental pictures that children see when reading are not products of imagination. These mental pictures are bounded by the words of the author and cannot roam freely where they wilt. The mental picture is a cooperative effort on the part of the child and the author. The need for detail in imprinting the picture of what the author has to say in the mind is the basis for the outmoving mental picture of the child. From the focal point of attention or stimulus provided by the author the child moves out and beyond filling in behind and around the center stimulus to paint a complete picture of character and setting. The picture is of necessity related to what the child knows from actual experience or from other reading experiences he may draw upon. These are

cases felt guilty about keeping the visual images. The pictures are a source of pleasure to them and in the subjective opinion of most of the children they felt it was wrong to see anything the author did not say. Since the visual is present in some degree in most children, the teaching of mental imagery might well begin in that area and proceed to the teaching of the rarer types. Success in promoting visual imagery alone would, in the opinion of the author, produce a great many happy and satisfied readers.

Suggestions for Further Study

1. A study of mental imagery on paragraphs varying in degree of difficulty of content thought or idea.
2. A study, similar in form to this, in which the children would read the questions on imagery silently and write the answers to discover if the amount of imagery is impeded.
3. A study, similar in form to this, in which the age group would be younger to discover the varying degree in the amount of imagery in relation to age.
4. A study of the relevance of imagery by means of questioning imagery immediately after reading and after a lapse of time questioning the imagery on the same selection again without allowing the subjects to re-read the selection. The purpose of this to discover if the extraneous images were relevant to the content in enabling the subject to remember the content images and extraneous images.
5. A study utilizing the findings of previous studies on

imagery to set up a basic criteria for analysing the amount and quality of imagery.

7. A study of imagery on various selections using the above criteria.
8. A comparison of the presence of mental imagery with the reading achievement of children.
9. The building of a set of lessons to teach visual imagery.
10. A study using the set of lessons with an experimental and control group.

BIBLIOGRAPHY

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I. Books

- Bentley, Madison, The Field of Psychology. New York: Appleton and Company, 1925.
- Butcher, S. H., Aristotles Theory of Poetry and Fine Art, London: The Macmillan Company Limited, 1927.
- Cattell, Raymond B., General Psychology. Massachusetts: Sci-Art Publishers, 1941.
- Kelley, W. A. & M.R., Introductory Child Psychology. Milwaukee: The Bruce Publishing Co., 1936.
- Galton, Francis, Inquiring Into Human Faculty and Its Development. London: Macmillan Company, 1883.

II. Articles

- Bentley, Madison, "The Memory Image and It's Qualitative Fidelity", The American Journal of Psychology, Vol. II, 1899.
- Clarke, H., "Conscious Attitudes", American Journal of Psychology, Vol. XXII, 1911
- Colvin S. & Myers M. R., "The Development of Imagination in School Children and The Relation Between Ideational Types and The Retentivity of Material Appealing to Various Sense Departments", Psychological Monograph, Vol. II, 1909.
- Lay, Wilfred, "Mental Imagery", Psychological Review Monograph, Supplement II, No. 3, 1898.
- MacLennon, S. F., "The Image and the Idea", The Psychological Review, 9:70, 1902.
- Whipple, Guy M., "The Obtaining of Information: Psychology of Observation and Report", The Psychology Bulletin, 15:7, 1918.

Thesis

- Wavle, Ardra S., A Study of Mental Imagery in Silent Reading, unpublished Master's Thesis, Boston University, 1939.

Phipps, Marian E., Analysis of Mental Imagery, unpublished
Master's Thesis, Boston University, 1944.

APPENDIX

APPENDIX

Included in the Appendix are two master tables one for boy subjects and one for girl subjects on which are tabulated the following facts for both paragraphs:

1. The total number of images per case on both paragraphs.
2. The total number of images per case on each type of imagery on both paragraphs.
3. The total number of images per case for the two paragraphs.
4. The total number of images for girls on each paragraph.
5. The total number of images for boys on each paragraph.
6. The total number of times the various types of imagery appeared in each paragraph for boys and girls.

The tables are read across to find the total number of times a particular type image appeared in each subject and the total number of times that type of imagery appeared in all girl or boy cases on that paragraph.

The tables are read down to find the types of imagery each subject reported and the number of times reported.

Also included in the Appendix are sample responses reported verbatim as the children gave them.

TABLE VIII

Total Amount of Imagery and Total Amount of Types of Imagery
Reported by Fourteen Girl Subjects on Both Paragraphs

OUTDOOR PARAGRAPH

Case Number	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Totals
Visual	36	34	38	55	22	53	49	36	18	47	21	37	26	23	491
Auditory	0	0	0	0	1	2	4	2	1	3	0	1	0	0	14
Gustatory	0	0	0	0	1	0	0	0	0	1	0	0	0	0	2
Olfactory	0	0	0	1	0	0	0	1	0	1	0	0	0	0	3
Tactile	0	0	0	1	0	0	0	0	0	1	0	1	0	0	3
Color	2	6	2	24	5	8	9	7	4	12	6	4	11	16	116
Motor	2	5	2	9	3	8	8	3	3	3	3	5	4	5	63
Time	1	1	0	2	1	1	2	1	1	1	1	0	1	0	13
Kinaesthetic	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Emotion	1	1	1	1	0	1	0	0	1	1	1	1	1	1	11
Total Outdoor	42	47	43	93	33	73	72	50	29	71	32	49	43	45	722

INDOOR PARAGRAPH

Visual	25	29	16	52	21	34	42	28	17	17	15	16	14	16	342
Auditory	0	2	3	0	1	3	2	1	1	1	1	0	3	0	18
Gustatory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olfactory	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Tactile	1	1	0	1	0	2	0	1	0	1	0	0	0	1	8
Color	3	5	2	18	5	15	14	9	4	2	4	7	6	3	97
Motor	1	7	4	7	2	4	4	3	2	1	1	2	1	1	40
Time	0	1	0	1	0	1	0	1	2	1	2	0	0	0	9
Kinaesthetic	0	1	0	0	0	0	0	0	0	1	1	0	0	0	3
Emotion	1	0	0	1	0	1	0	0	0	0	0	0	0	0	3
Total Indoor	31	46	25	80	29	61	62	43	26	24	24	25	24	21	521
Total for Both Paragraphs	73	93	68	173	62	134	134	93	55	95	56	74	67	66	1243

Case #22 - highest total score on both paragraphs.
OUTDOOR

- ROAD - There are pebbles and stones on the road - a tar sidewalk. It's shady - pine trees and oak trees make a tunnel. There is a white house on one side. It's a white house with a shingled roof and porch. It has a purple door and a fence - a white fence around the yard. There are red flowers in the yard tulips and roses.
- BOY - black, curly hair, brown pants, red checkered jersey, brown and white shoes, checkered sox to match shirt. He has green-blue eyes. His hands are in his pockets and he's all dressed up. It's Sunday. He's walking away from me.
- DAY - The sun is in front. There is a little breeze. I feel it on my face. It's afternoon.
- GRASS (boy puts in mouth) - lawn grass. The grass is in the yard of the house. He puts the whole piece in his mouth. It's dry. I don't taste it.
- FIELD - on left, big, oak tree and weeping willow near road. Daffodils, forsythia growing. There are two horses, one is black with a little white, one is all brown. Two ladies are getting ready to ride horses. One lady has on brown pants, blue jacket. The other has on a red sweater and black pants.
- POND - I see the pond clear. It's not far from the road. No trees around it. Just sky beyond the pond. The field slopes down to the pond.
- FENCE - ordinary picket fence - not high- red. The boy leaps over the fence. The grass is like hay - yellow. Yellow and red flowers found in fields.
- FLOWER - he picks flower in lady's yard. It's a geranium - red. He throws it on ground and steps on it.
- BOY RUNNING - runs towards road. Grass moves when he runs through it. He's going home. I see part of his house, its light red - screen porch - blue door.
- Subject felt her picture was very clear. She said she saw more while talking with examiner than while reading.

Case #22 - INDOOR

GIRL - She has blond hair in braids. A yellow dress, yellow
socks and black patent shoes - yellow checkered ribbon
on braids. She's dressed up.

ROOM - green wallpaper- maple bed and bureau to match-
pictures scattered on bed. It's her bedroom. There
is a scrapbook. There is one chair like the bed.
White ruffled curtains - yellow spread with red dots.
The girl is sitting on the bed looking for pictures in
a magazine.

CLOCK - old fashioned clock on wall.

ANIMAL - cat - black - small. The cat is sitting watching
the girl.

SOUND OF CLOCK - light tinkling sound. Girl turns around
to see clock. The clock is behind her.

She gets excited and jumps up fast. She walks towards
me. There are pine trees outside the window. It
is foggy out but light.

TABLE - at bottom of bed near window - maple. There are
lots of things on it - perfume, doll dressed in blue
with white socks and shoes and blond curly hair. A
lampsade with ships and a white base.

SCISSORS - small black scissors. She cuts a baby picture
from the magazine and pastes it in scrapbook. The
baby has on diapers.

The subject felt her picture on the outdoor paragraph was
clearer, but she sees the girl clearer than the boy.

Case #2 - highest total score on outdoor for boys

ROAD - dirt road and narrow. Shady under tree on right but the rest is sunny. Low, wooden fence on right - brown. There is a house - small and white. Flowers in yard. Tall man on side of road in field cutting grass.

BOY - work clothes, straw hat, yellow sport shirt. He is about 10 years old. He's walking away from me but he keeps stopping. Blond hair and blue eyes. He's swinging his arms. Very happy.

DAY - The sun is in back of the boy. There is no wind. The sky is blue with big, fluffy clouds. Noontime.

GRASS - (boy puts in mouth) The grass is on the side of the road and comes to the boy's knees. It's dry grass - yellowish. He bites of the end of the grass. He has nice teeth - even. It's a small piece of grass.

FIELD - on right. It's a big field with cows.

POND - little way from road. Broadleaf trees around it. Tall mountains beyond the pond - white on top. Ducks on pond - red-headed ducks. Land slopes down.

JUMP - He swings over the fence using his hands. Grass near it is almost to the top. Grass in field is not high but it is thick.

FLOWER - daisy - tall, white, yellow center. I hear the crunch of the grass as the boy walks. He picks flower and puts it up to his face. Puts it back on ground.

RUN - I didn't see what was in the grass. The boy just began to run. He goes towards the farm. No, I didn't see the farm at all.

This boy felt his picture was clearer when he was reading and he saw more when he was reading. He felt his outdoor picture was clearer than indoor.

Case # 4 - highest total score on indoor for boys

GIRL - high school girl, brown hair, long and curly. She is dressed in her play clothes. Reading a history book. Doing her homework.

ROOM - saw a table in the corner - a green table. The girl is sitting at the table. That's all I was able to see of the room. There is a window by the table. Two windows on the other side of the room. There is a different colored rug on the floor. It's a soft rug-like down.

CLOCK - old grandfathers clock - it makes a loud sound like the bells in church - a gong sound. The clock is on the other side of the room from the table. The dog is barking.

DOG - It's a collie dog - brown and white - bushy tail - big. The girl pats the dog and he stops barking. I think the clock scared him.

SOUND (of clock) - The clock struck 5 times. The girl turns around and looks at the clock. She is sitting at the table facing window and has to turn around because the clock is on the other side of the room.

The girl pushes away from the table. She pushes with her hands. The book closes itself. She walks towards me. Now I can see a tree through the window - an oak tree. It's a warm, sunny day - summer.

TABLE - It's a round, little table - shiny. It's near the windows on the other side of the room. There is nothing on the table but scissor. They are very big scissors. She walks back to other table and cuts something out of a big piece of white paper. The paper is near the book she was reading.

This boy felt his picture was blurred. He had nine more images on the outdoor paragraph than indoor and did well on both. He identified the girl as his cousin but was not sure whether he was right or not.